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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,755	08/09/2006	Yoshiaki Sonobe	Q9-473	6031
23373 7590 11/16/2009 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER HARRIS, GARY D				
ART UNIT		PAPER NUMBER		
1794				
NOTIFICATION DATE		DELIVERY MODE		
11/16/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com  
PPROCESSING@SUGHRUE.COM  
USPTO@SUGHRUE.COM

# Office Action Summary

**Application No.**

10/576,755

**Applicant(s)**

SONOBE ET AL.

**Examiner**

GARY D. HARRIS

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 5 and 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 5 & 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 1, 5 & 6 have been considered but are moot in view of the new ground(s) of rejection. Applicant's amendments to claims now requiring a non-granular structure within the ferromagnetic layer (see applicants Paragraph 5, 23 & 27) and structure further describing the perpendicular magnetic recording layer has resulted in a new rejection as follows:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

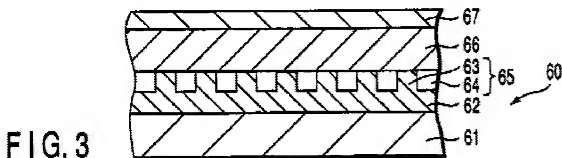
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 & 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. US 2004/0058197 in view of Chang et al. US 7,081,268.

As to Claim 1, Nakamura et al. US 2004/0058197 discloses a perpendicular recording medium and a disk (121) as illustrated in figure 5 (Paragraph 91). The disk includes a substrate (61), a soft magnetic layer (62), a granular magnetic layer (65) in which the granular layer comprises crystal grains made of cobalt. Layer (66) on top of the granular layer is a perpendicular magnetic recording layer having no magnetic

grains (Paragraph 89). With regard to the grain boundary portion being mainly  $\text{SiO}_2$ , Nakamura clearly states the nonmagnetic matrix is an oxide of  $\text{SiO}_2$  (Paragraph 82). Additionally, the soft magnetic layer is an Fe-based or Co-based material (Paragraph 80). The ferromagnetic layer is CoPt or CoPtCr (applicants CoCrPt) and does not require an oxide (Paragraph 79). The structure is made in the order as claimed by applicant as illustrated in figure 3 below:



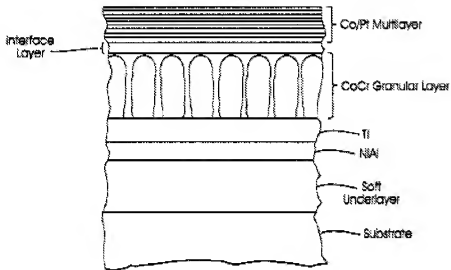
Nakamura '197 does not specify that the  $\text{SiO}_2$  content in the grain boundary portions are made of 6 atomic percent or more. However, Chang et al. US 7,081,268 discloses granular recording medium and adjusting the  $\text{SiO}_2$  content of a CoCrPt alloy in obtaining a desired signal to noise ratio (SNR) (Col. 13, 14, Line 50-67, 1-6 respectively). It would have been obvious to one of ordinary skill in the art to adjust the  $\text{SiO}_2$  in a cobalt based material in order to adjust the SNR as taught in the '268 patent.

Claim 6 is similar to claim 1 with the added limitation of the method of using argon in the deposition process. Claim 6 is directed to a method of forming, a restriction has not been made between the method and article claims as no substantive limitations

have been presented at this time. The examiner notes if applicant amends method claims and adds substantive limits a restriction may be required at that time. Nonetheless, Nakamura '197 discloses utilizing Ar mixed with 0.05% O<sub>2</sub> while depositing the the lower CoPtCrO recording layer under a discharge of 250 W (DC) and pressure of 20 Pa (Paragraph 101). Additionally, Nakamura '197 discloses 1000W, in an Ar gas atmosphere to deposit a granular layer at a variety of thicknesses from 10-600 nm (Paragraph 131). Nakamura '197 adjusts the environment by manipulating wattage, atmosphere and pressure to obtain a thickness of the desired layer. It would have been obvious to one skilled in the art to adjust the deposition environment (Ar gas pressure, current\*voltage (Wattage)) when adjusting the environment in order to control the deposition thickness.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. US 2004/0058197 in view of Chang et al. US 7,081,268 and further in view of Ikeda et al. US 6,468,670.

As to Claim 5, Nakamura '197 in view of Chang '268 disclose the perpendicular magnetic recording media as claimed but does not disclose inserting layers of Pt or Pd in between the Co alloy layers. However, Ikeda et al. US 6,468,670 discloses a multilayer configuration in which the continuous layer (applicants group consisting of CoCrPt, CoPt, CoPd, CoPt<sub>3</sub>, and CoPd<sub>3</sub> layers) has a Pt or Pd layer inserted between the multilayer structure as shown below:



The insertion of the Pt or Pd layers between the Co layers (Co/Pt Multilayer) produces a strong perpendicular exchange coupling at the interface and produces higher linear recording density (Col. 2, Line 7-41). It would have been obvious to utilize a multilayer configuration where a Pt or Pd layer is provided between the ferromagnetic layer to produce a strong perpendicular exchange coupling and result in a higher linear density as taught by Ikeda '670.

Column and line numbers are provided for convenience. However, the entire reference should be considered.

#### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GARY D. HARRIS whose telephone number is (571)272-6508. The examiner can normally be reached on 8AM - 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkowsky can be reached on 571-272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. D. H./Gary D. Harris  
Examiner, Art Unit 1794

/JENNIFER MCNEIL/  
Supervisory Patent Examiner, Art Unit 1794